AMENDMENT TO THE CLAIMS

1. (currently amended) A temperature regulated, enclosed intrinsically safe electrical energy storage cell pack for an intrinsically safe hand held portable instrument in an industrial process control system, comprising:

a plurality of electrical energy storage cells wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side;

a plurality of electrical interconnects arranged to electrically connect adjacent electrical energy storage cells;

electrical leads configured to couple the plurality of electrical energy storage cells to the intrinsically safe to the hand held instrument;

a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

a first layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cells, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cells, and the first layer having a first thickness and a first value of thermal conductivity;

a second layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the first layer, contacts all of the outer surface of the first layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defining an exterior surface of the enclosure of the electrical energy storage cell which separates the electrical energy storage cell pack from the explosive environment, the second layer having a second thickness and a second value of thermal conductivity; and the first and second thicknesses and the first and second values of thermal conductivity conforming the enclosed electrical energy storage cells to a combustible atmosphere temperature classification that

specifies an outer surface temperature during an electrical short circuit of an electrical energy storage cell, the enclosure controlling the outer surface temperature of the combined enclosure and electrical energy storage cells such that the temperature regulated, enclosed electrical energy storage cell pack comprises intrinsically safe equipment in the explosive environment;

a protective device including a fusible link coupled to a connected lead and the electrical storage cells which is encased in potting compound; and

wherein an exterior temperature of the second layer is less than 130°C during the electrical short circuit of the electrical energy storage cell.

2. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the electrical energy storage cell produces heat at a hot spot during the short circuit and the first layer of material spreads flow of the heat over a portion of the outer surface of the first layer that is larger than the hot spot and the second layer of material retards flow of the heat to an outer surface of the second layer.

3. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the temperature of the outer surface of the second layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition.

4. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the first layer of material comprises aluminum.

5. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the first layer of material comprises copper.

6. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the second layer of material comprises heat-shrink tubing.

7. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the second layer of material comprises elastic material.

8. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the first layer comprises two thermally conductive half-shells that each enclose one side of a round surface of the energy storage cell.

9. (currently amended) An intrinsically safe battery for an intrinsically safe hand held portable instrument in an industrial process control system comprising:

a plurality of electrical energy storage cells that comprise at least one hot spot during a short circuit, wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side in each cell being covered by a first layer of thermally conductive material that has a first thickness and a first value of thermal conductivity and that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cell, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cell, the first layer being enclosed by a second layer of thermally insulating material to form a plurality of enclosed cells, the second layer which contacts all of an outer surface of the first layer and defining an exterior surface which separates the electrical energy storage cells from the explosive environment, the second layer preventing contact between the combustible gas and the first layer, and the second layer being shaped to conform to an outer surface of the first layer, the second layer having a second thickness and a second value of thermal conductivity, and the first and second thicknesses and the first and second values of thermal conductivity conform the battery to a combustible atmosphere temperature classification that specifies an outer surface temperature during an electrical short circuit of the electrical energy storage cell, a plurality of

electrical interconnects arranged to electrically connect adjacent electrical energy storage cells, a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

electrical leads configured to couple the plurality of electrical energy storage cells to the intrinsically safe to the hand held instrument;

a protective device including a fusible link coupled to a connected lead and the electrical storage cells which is encased in potting compound;

electrical interconnections that interconnect the plurality of electrical energy storage cells in a series circuit with the protective device, the combination of the first and second layers and the protective device rendering the battery intrinsically safe; and

wherein an exterior temperature of the second layer is less than 130°C when the electrical short circuit is provided across the electrical energy storage cells.

10. (previously presented) The battery of Claim 9 further comprising: a plastic resin shell shaped to receive the plurality of enclosed cells and the protective device.

11. (previously presented) The battery of Claim 10 wherein the plastic resin shell includes plastic resin separation bars positioned between the enclosed cells and the electrical interconnections to reduce shorting.

12-23. (cancelled)

24. (currently amended) ~~An~~A hand held intrinsically safe portable instrument for an industrial process control system apparatus, comprising:

a data acquisition unit; and

an intrinsically safe battery for the data acquisition unit, comprising:

a plurality of electrical energy storage cells that comprise at least one hot spot

during a short circuit, wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side, each cell being covered by a first layer of thermally conductive material that has a first thickness and a first value of thermal conductivity and that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cell, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cell, the first layer being enclosed by a second layer of thermally insulating material to form a plurality of enclosed cells, which contacts all of an outer surface of the first layer and the second layer defining an exterior surface of an enclosure of the electrical energy storage cells which separates the electrical energy storage cells from the explosive environment, the second layer preventing contact between the combustible gas and the first layer, and the second layer being shaped to conform to an outer surface of the first layer, the second layer having a second thickness and a second value of thermal conductivity, and the first and second thicknesses and the first and second values of thermal conductivity conform the battery to a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell, a plurality of electrical interconnects arranged to electrically connect adjacent electrical energy storage cells, a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

electrical leads configured to couple the plurality of electrical energy storage cells to the intrinsically safe to the hand held instrument;

a protective device including a fusible link coupled to a connected lead and the

electrical storage cells which is encased in potting compound;

electrical interconnections that interconnect the plurality of enclosed cells in a series circuit with the protective device to form an intrinsically safe battery; and

wherein an exterior temperature of the second layer is less than 130°C during the electrical short circuit of the electrical energy storage cell.

25. (previously presented) The apparatus of Claim 24 wherein the apparatus is portable.

26. (previously presented) The apparatus of Claim 25 wherein the apparatus is handheld.

27. (previously presented) The apparatus of Claim 24 wherein the apparatus is intrinsically safe.

28. (previously presented) The apparatus of Claim 24 wherein the short circuit is external to the battery.

29.(previously presented) The apparatus of Claim 24 wherein the enclosed cells are rechargeable.

30. (currently amended) ~~An~~A hand held portable intrinsically safe apparatus an explosive environment, comprising:

~~a~~an intrinsically safe calibrator; and

an intrinsically safe battery for the calibrator, comprising:

a plurality of electrical energy storage cells that comprise at least one hot spot during a short circuit, wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side, each cell being covered by a first layer of thermally conductive material that has a first thickness and a first value of thermal conductivity and that is shaped to conform to a cylindrical portion of an outer surface of the electrical

energy storage cell, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cell, the first layer being enclosed by a second layer of thermally insulating material to form a plurality of enclosed cells, the second layer which contacts all of an outer surface of the first layer and defining an exterior surface of an enclosure of the electrical energy storage cells which separates the electrical energy storage cells from the explosive environment, the second layer preventing contact between the combustible gas and the first layer, and the second layer being shaped to conform to an outer surface of the first layer, the second layer having a second thickness and a second value of thermal conductivity, and the first and second thicknesses and the first and second values of thermal conductivity conform the battery to a combustible atmosphere temperature classification that specifies an outer surface temperature during a short circuit of the electrical energy storage cell, a plurality of electrical interconnects arranged to electrically connect adjacent electrical energy storage cells, a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

a protective device including a fusible link coupled to a connected lead and the electrical sensory storage cells which is encased in potting compound;

electrical interconnections that interconnect the plurality of electrical energy storage cells in a series circuit with the protective device to form an intrinsically safe battery; ~~and~~

electrical leads configured to electrically couple to the intrinsically safe calibrator; and

wherein an exterior temperature of the second layer is less than 130°C during the

short circuit of the electrical energy storage cell.

31. (previously presented) The apparatus of Claim 30 wherein the apparatus is portable.

32. (previously presented) The apparatus of Claim 31 wherein the apparatus is handheld.

33. (previously presented) The apparatus of Claim 30 wherein the apparatus is intrinsically safe.

34. (previously presented) The apparatus of Claim 30 wherein the short circuit is external to the battery.

35. (previously presented) The apparatus of Claim 30 wherein the enclosed cells are rechargeable.